Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

LIBRARY
CURRENT SERIAL RECORD
JUL 23 1956

622
-R312
p.2

Research Note
UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
INTERMOUNTAIN FOREST & RANGE EXPERIMENT STATION
OGDEN UTAH

No. 31 May 1956

ELECTRONIC RECORDER AS AID IN AERIAL INSECT SURVEYS

Richard I. Washburn
Division of Forest Insect Research

INTRODUCTION

Tests during 1955 in the Intermountain region proved that electronic sound writers (dictating machines) can be adapted successfully for use in aircraft during aerial insect surveys. The description of the equipment and its advantages are presented for guidance of others who may wish to try similar machines.

During aerial surveys to detect insect damage it is almost impossible to write enough information to properly appraise what has been seen once the observer is back on the ground. In the past, survey data have been recorded on the map by using different colored pencils and various symbols. A red dot indicated damage caused by bark beetles, and the size of the dot the number of recently faded trees in the group, (small dot less than 10 trees, medium dot more than 10 but less than 50 trees, large dot more than 50 trees). A 2-letter abbreviation of the bark beetle thought to be responsible was placed alongside the dot. In general this was the limit of the information that could be recorded concerning bark beetle infestations in addition to mapping of infested areas in flight.

The more common defoliators were each designated by separate colors, but instead of dots the symbols L (light), M (medium), and H (heavy) were used to denote the average degree of defoliation. In addition, the boundaries of defoliator infestations were sketched on the maps. Sometimes it was possible to write brief generalities concerning large areas of defoliation, but as a rule the descriptions were sketchy.

Thus, the surveys have been limited by the lack of detailed information and subject to misinterpretation once the data became "cold." To overcome these limitations one of two things was possible: (1) greatly increase the flying time necessary to cover a given area,

(2) improve and speed up methods of recording the "in flight" data. The second alternative appeared promising. It seemed logical to first try recording devices.

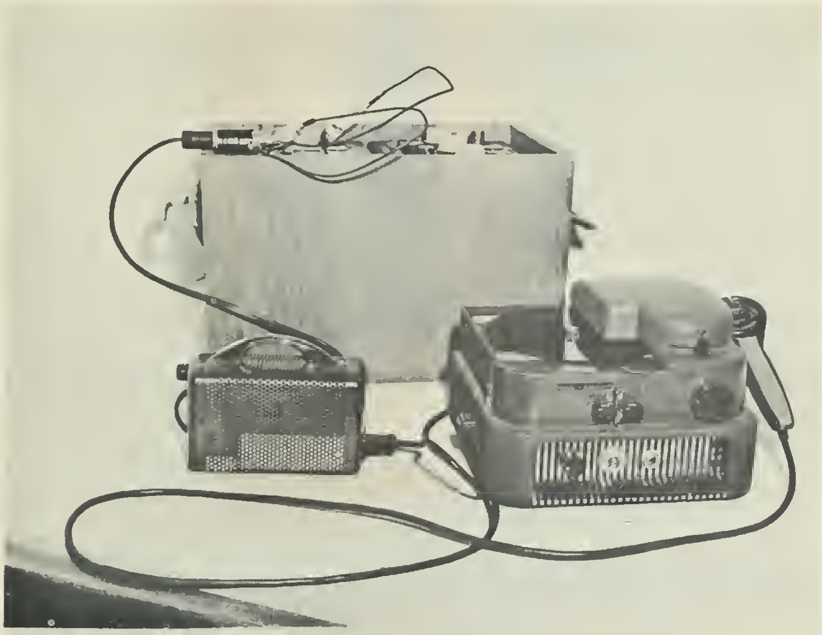
An office-type electronic sound writing device (dictating machine) was adapted for use in small aircraft to test its value and efficiency in recording "in flight." The tests proved that the machine, as adapted, could be easily operated by the observer. The records did not pick up any of the airplane noises and were not jumbled or scratched even though subjected to severe jarring and change of position. The operation, recording, and transcription of the records proved that the machine functioned as well in the aircraft as it did on an office desk. To further test its practicability the machine was used to record the location and description of the infested areas observed during the annual aerial survey conducted in the fall of 1955.

INSTALLATION

Since the aircraft used on surveys are rented it was necessary that the equipment be portable and easily installed. To eliminate any difficulties that might be encountered in using the aircraft electrical power, two standard 6-volt automobile batteries were placed into a suitably constructed wooden box. This box of batteries was placed on the floor between the front and rear seats in the right hand side of the plane. One fully charged battery operated the recorder for approximately 6 hours, with the second carried as a spare. Connection between the batteries and the converter was effected with an automobile dashboard electric cigar lighter outlet wired to two battery terminal clamps. A converter, which is a standard accessory so that 110-volt machines can use the power from automobiles, was placed on the right rear seat with the dictating machine. The observer occupied the right front seat and held the microphone. The machine was turned on and set to record. The observer operated the machine by the stop and start control on the microphone. Discs could easily be changed by the operator reaching back with his left hand. In the Cessna 180 planes used there was still ample room for a passenger on the left side of the rear seat. The machine used was a Gray Audograph Model BIXD-4S Executive. It was found to be entirely satisfactory. However, any dictating machine could be used if it contained an input volume control, which by lowering the input volume eliminates airplane motor noise. Any machine used should be so constructed that it will record from any position while subjected to the bouncing and jarring encountered in low altitude mountainous flying.

PROCEDURE

During the surveys all infested areas were located on maps as observed and identified by number or letter. The identifying letter or number and a description of the conditions were talked into the machine as the observer viewed the infestation or damage. It was possible to record tree species, probable causal agent, extent of damage, trend if apparent, pertinent stand or site conditions, and much additional data that later proved helpful in interpreting the problem. No difficulty was encountered in recording all of these data since the observer could concentrate on his examination. At the end of each day's flight the day's recordings were mailed to the office for transcription. It was found that after a little practice the observer could describe the damaged areas in such a manner that with only a minimum amount of editing it fulfilled the requirements of a written survey report.



Sound writing machine adapted for use in small aircraft. Six-volt batteries in box connect through automobile cigar lighter receptacle to converter which furnishes stepped up voltage to Audograph. Dictation recorded on plastic discs.